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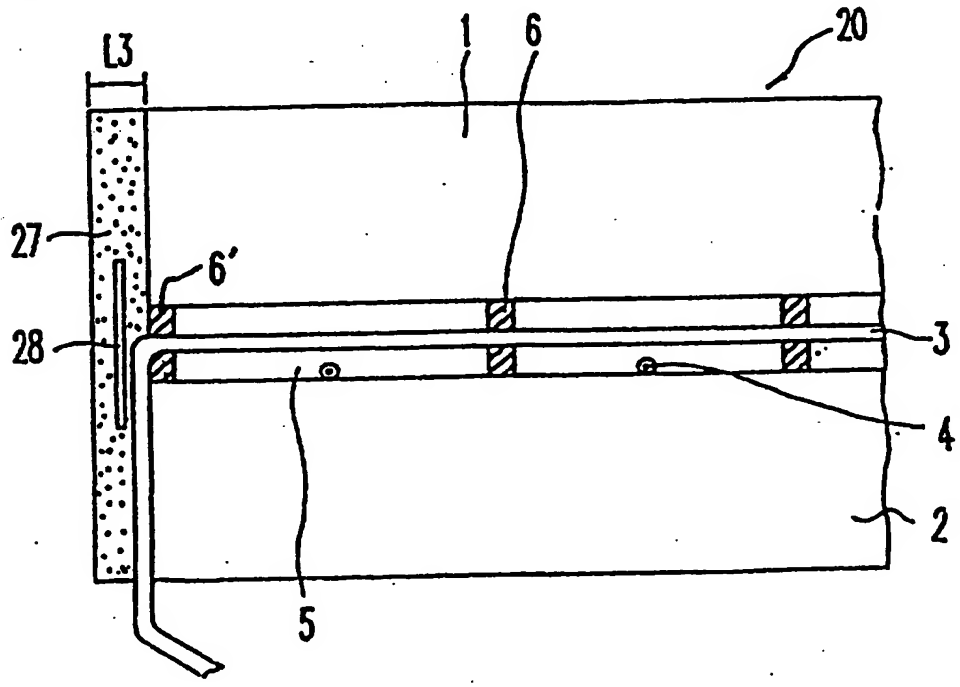

(57) Abstract

The Plasma Display Panel (PDP) having an improved sealing structure is disclosed. In a conventional PDP, the seal is formed inwardly in the cell gap between the upper and lower substrates, thus expands the area of non-effective screen, and causes the division of screen of a multi-screen system due to the resultant large element pitch. According to the present invention, the seal (27) is formed vertically at side ends of two substrates (1, 2), to reduce the breadth thereof. It expands the area of effective screen and achieves a natural image of multi-screen system due to the reduced element pitch.

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PLASMA DISPLAY PANEL

TECHNICAL FIELD

The present invention relates to a Plasma Display Panel(PDP), and particularly to the sealing structure thereof.

BACKGROUND ART

In the field of the display technic, researches and developments have been progressed for achieving a large screen display. It reveals that a PDP is most suitable to construct a large screen as a unit device, considering the cost and the space efficiency. Meanwhile, the adoption of the projection system or the multi-screen system has been contemplated for achieving a large screen in the field of the Cathode Ray Tube or the Liquid Crystal Display.

The PDP is also suitable to construct the multi-screen system, as it can easily be fabricated in a large unit panel. The large area multi-screen system is constructed by stacking a plurality of unit PDPs in a matrix form.

In the fabrication of the multi-screen system, if the border between each PDPs respectively forming element screen, is excessively noticeable, the overall screen is devided to form a mosaic shape and deteriorate the natural expression of the image.

Thus, a minimum breadth of the seal element PDP would result a minimum division of the screen of the multi-screen system.

Referring to FIG. 1, a conventional display PDP 10 comprises an upper substrate 1 and a lower substrate 2 respectively formed of transparent dielectric material such as glass, cathodes 3 and anodes 4 arranged therebetween in the form of matrix, and barriers 6 for separating cross points thereof to form display cells 5, respectively being the picture element for displaying image. Cathodes 3, anodes 4 and barriers 6 are respectively formed on the upper and lower

substrates 1, 2. And then, two substrates are sealed to form the PDP 10. Sealant is applied on the circumference of any one of the upper or lower substrates by a prescribed breadth inwardly in the cell gap, and is sealed by thermal curing after laying another substrate on the applied substrate.

The resultant PDP having above described sealing structure, accordingly, has the seal 7 which is non-effective portion not displaying an image, of a considerable breadth L1 at the circumference thereof.

The breadth L1 of the seal 7 should be formed a considerably large dimension for the sake of the strength or the reliability of sealing.

Meanwhile, a plurality of the above described PDPs 10 are stacked by a matrix to form a multi-screen system, as shown in FIG. 2.

To the outside of each PDPs 10, multiple connecting lines for applying drive or signal voltage, for example, connection lines for cathodes 3 of FIG. 1, are extended. To prevent the contact between connection lines of adjacent two PDPs 10, dielectric layers 9 of considerable thickness should be applied on the connection lines.

As the result, a border having the breadth L2, corresponding to the twice of the sum of the breadth L1 of the seal 7 and the thickness of the dielectric layer 9 of two PDPs 10 formed along the peripheral of the effective screen marked in broken line, between two PDPs 10.

As the border forms the non-effective screen which cannot be used for displaying image, the overall screen which cannot be used for displaying image, the overall screen of the multi-screen system results in a mosaic type screen divided by border lines respectively having the same thickness as the breadth L2 of the border. The breadth L2 of the border is generally referred to as "the display element pitch."

To solve the above described problems, a structure adopting a separate seal glass, was suggested. But the glass requires a

considerable thickness for the sake of the reliability and workability of sealing, thus is not suitable for reducing the breadth of the border.

DISCLOSURE OF THE INVENTION

It is, therefore, an object of the present invention to provide a PDP having the reduced area of non-effective screen, and capability of displaying natural image on a multi-screen system by reducing the display element pitch to the minimum.

To achieve the above object, there is provided a PDP constructed by sealing circumferences of an upper and lower substrates, characterized in that seal is formed by applying a sealant on side ends of two substrates.

According to one aspect of the present invention, a sealant is pressed by a prescribed pressure after applying.

According to another aspect of the present invention, a barrier is formed at the outside of the cell gap between two substrates to prevent the penetration of the sealant.

According to other object of the present invention, a solid support is embedded at the inside of the seal to prevent the excessive pressing of the seal and the resultant variation of the breadth of the seal.

BRIEF DESCRIPTION OF THE DRAWINGS

These and other objects and advantages of the present invention will be more apparent from the following detailed descriptions with reference to the accompanying drawings, in which:

FIG. 1 is a sectional view illustrating the seal structure of a conventional PDP

FIG. 2 is a plan view showing PDPs of FIG. 1 stacked in side by side;

FIG. 3 is a sectional view indicating the seal structure of a PDP according to the present invention; and

FIG. 4 is a plan view depicting PDPs of FIG. 3 stacked in side by side.

Referring to FIG. 3, a PDP 20 according to the present invention, comprises an upper substrate 1 and a lower substrate 2, and cathodes 3 and anodes 4 respectively arranged thereon, and display cells 5 formed on each cross points of cathodes 3 and anodes 4 by being partitioned with barriers 6.

The upper and lower substrates 1, 2 are sealed together after respectively being applied cathodes 3, anodes 4 and barriers 6.

According to the present invention, sealant for sealing the upper and lower substrates 1, 2 together, is not applied horizontally between two substrates 1, 2 but applied vertically on side ends of two substrates 1, 2 to form the seal 27. Accordingly, the breadth L3 of the seal 27 is drastically reduced, comparing with that of the conventional seal.

Moreover, connection lines extended from cathodes 3, for example, to the side face of the lower substrates 2, can also be embedded in the seal 27, thus gets rid of necessity of additional dielectric layer(numeral 9 of FIG. 2).

The applied sealant is preferably pressed by a predetermined pressure to form the seal 27 of a predetermined breadth L3. To prevent the excessive pressing and the resultant variation of the breadth L3, a solid support 28 can be embedded in the seal 27.

The support 28 is preferably a thin plate of dielectric material similar to those of substrates 1, 2 and having a considerable rigidity. And the support 28 preferably has a breadth same as or larger than that of the cell gap between the upper and lower substrates 1, 2, and is laid vertically on the outside of the junction of two substrates 1, 2. For example, the support 28 can be formed in a sheet having the thickness of 0.55mm, and the breadth of 5~7mm.

Moreover, barriers 6' is preferably formed at the outside of the cell gap between two substrates 1, 2 to be contacted with the sealant by pressing.

As the seal 27 of the PDP 20 according to the present invention is formed vertically relative to the screen, the breadth L3 thereof can be formed in very small size. In other words, the breadth L3 of the seal 27 only requires the dimension capable of surrounding connection lines having the diameter of 0.12mm, for example, and the support 28 having the thickness of 0.55mm, thus can be fabricated in very narrow breadth.

As described above, the seal 27 has very small breadth L3 and no additional dielectric layer (numeral 9 in FIg. 2) for embedding connecting lines, thus the breadth L4 of borders can also be formed in very small size.

As the display element pitch is reduced to very narrow pitch, comparing with the size of the overall screen, the multi-screen system can express a natural and high quality image without the division of the screen.

Moreover, the PDP 20 according to the present invention not only reduces the area of non-effective screen, by forming the seal 27 on side ends of the upper and lower substrates 1, 2.

INDUSTRIAL APPLICABILITY

The PDP 20 of the present invention can be used as an independent display device with a high efficiency and space economy, as well as the unit panel of multi-screen system.

CLAIMS

1. A plasma display panel being fabricated by sealing the peripheral of an upper and lower substrates, respectively having cathodes, anodes, and barriers, characterized in that;

a seal 27 is formed by applying an sealant on side ends of said upper and lower substrates 1, 2.

2. A plasma display panel as claimed in claim 1, wherein said sealant is pressed by a predetermined pressure after applying.

3. A plasma display panel as claimed in claim 2, wherein a solid support 28 having a breadth same as or larger than that of cell gap between said two substrates 1, 2, is embedded at the inside of the seal 27.

4. A plasma display panel as claimed in claim 3, wherein said support 2 is formed of material similar to that of said upper or lower substrates 1, 2.

5. A plasma display panel as claimed in claim 1, wherein a barrier 6' is formed at the outside of the cell gap between said two substrates 1, 2 to be contacted with inner side surface of said seal 27.

FIG. 1

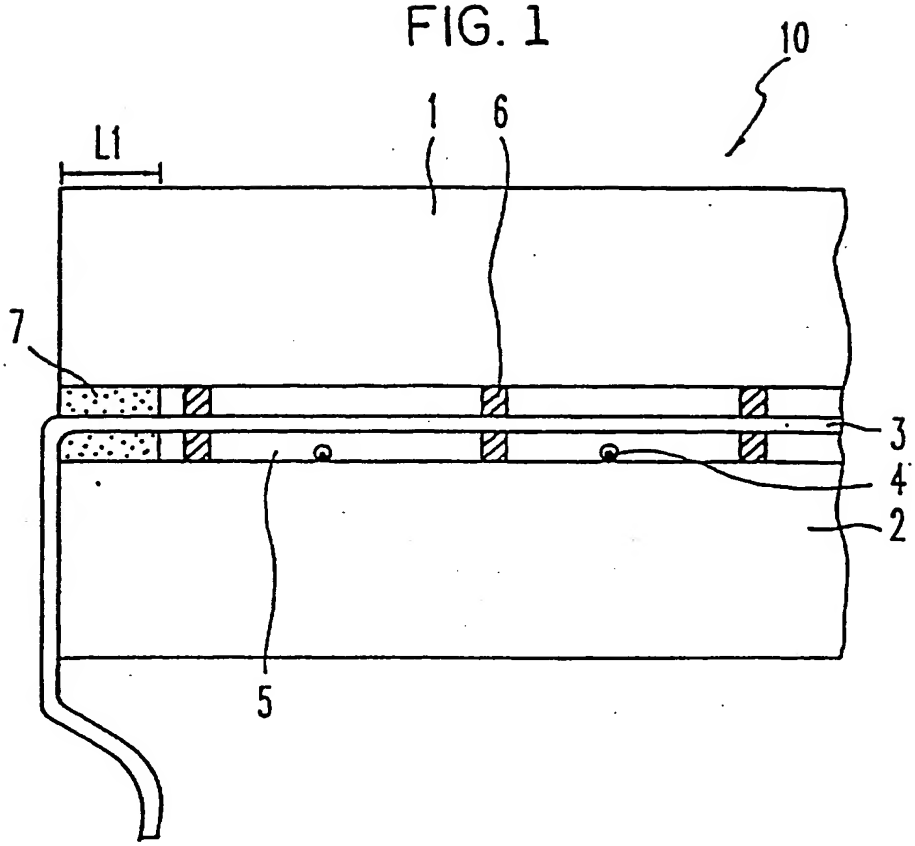

FIG.2

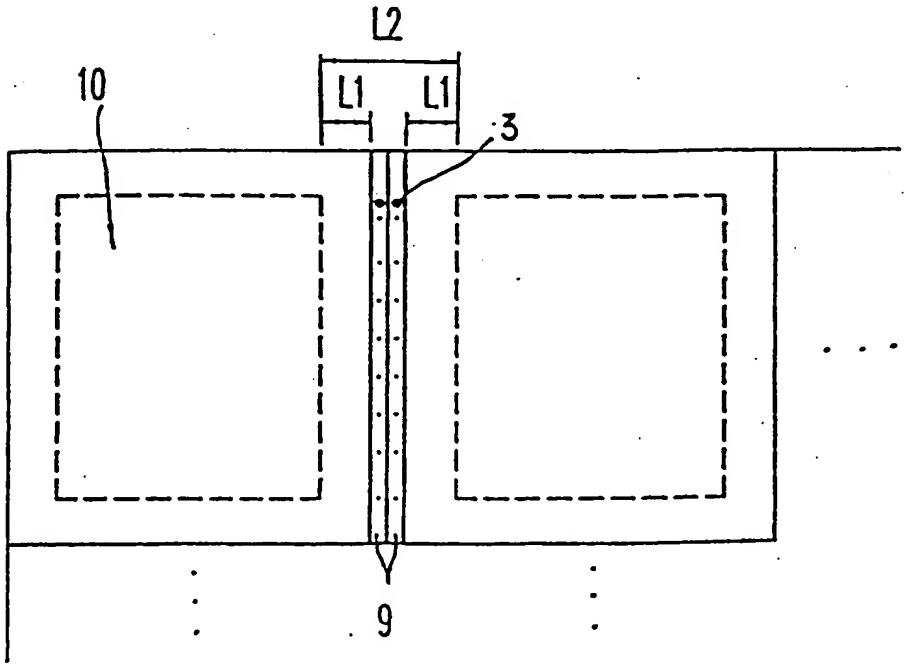

FIG.3

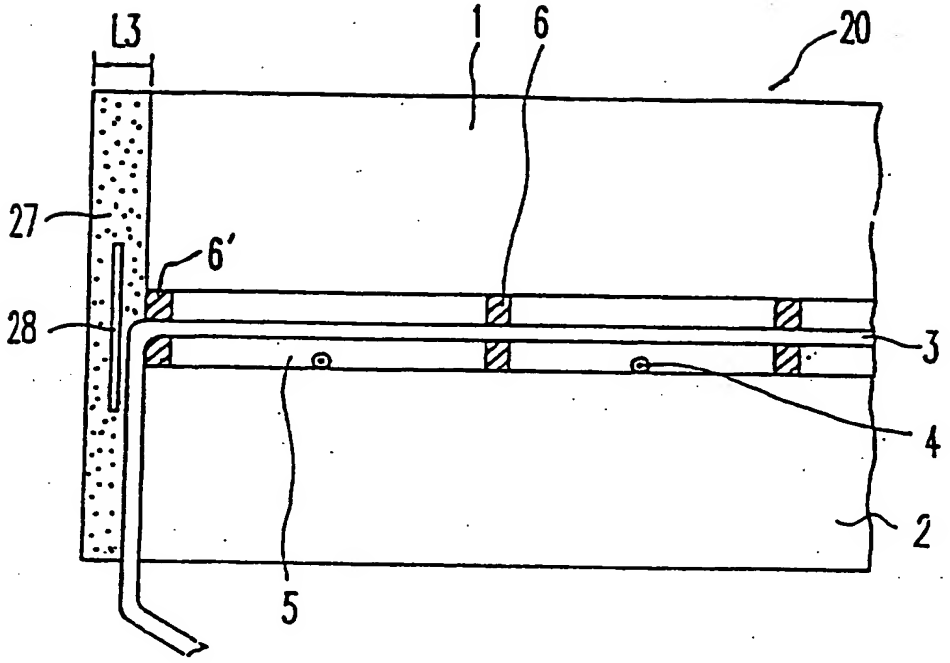

FIG.4